



A.D. 1839 . . . . . N° 7974.

S P E C I F I C A T I O N

OF

THOMAS HALL.

URNACES OF STEAM-ENGINE BOILERS, &c.

L O N D O N :

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY :

PUBLISHED AT THE GREAT SEAL PATENT OFFICE,

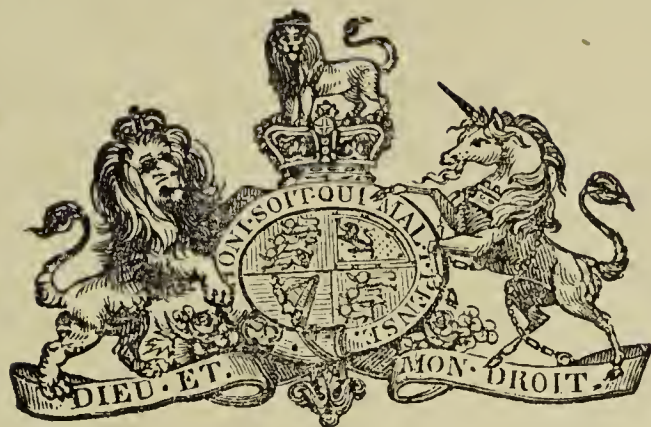
25, SOUTHAMPTON BUILDINGS, HOLBORN.

Price 9d.

1854.







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Furnaces of Steam-engine Boilers, &c.

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HALL'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, THOMAS HALL, of Leeds, in the County of York, Brass Founder, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her Royal Letters Patent under the Great Seal of Great Britain, bearing date  
5 at Westminster, the Twenty-first day of February, in the second year of Her reign, and in the year of our Lord One thousand eight hundred and thirty-nine, did, for Herself, Her heirs and successors, give and grant unto me, the said Thomas Hall, Her especial licence, full power, sole privilege and authority, that I, the said Thomas Hall, my executors, administrators, and assigns,  
10 and such others as I, the said Thomas Hall, my executors, administrators, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein mentioned, should and lawfully might make, use, exercise and vend, within England, Wales, and the Town of Berwick upon Tweed, my Invention of "A NEW COMBINATION OR ARRANGE-  
15 MENT OF PARTS FORMING AN IMPROVED FURNACE FOR CONSUMING SMOKE AND ECONOMIZING FUEL, APPLICABLE TO STEAM-ENGINE BOILERS AND OTHER FURNACES;" in which said Letters Patent is contained a proviso obliging me, the said Thomas Hall, by an instrument in writing under my hand and seal, particularly to describe and ascertain the nature of my said Invention, and in what



*Hall's Improved Furnace for Consuming Smoke and Economizing Fuel, &c.*

manner the same is to be performed, and to cause the same to be enrolled in Her Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear. 5

**NOW KNOW YE**, that in compliance with the said proviso, I, the said Thomas Hall, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, are particularly described and ascertained in and by the following description thereof, reference being had to the Drawing hereunto annexed, and to the letters and figures 10 marked thereon (that is to say) :—

My Invention of an improved furnace consists in a peculiar arrangement of two or more fire-places under one boiler, with the flues and dampers necessary for their effective operation, whereby the smoke and gases arising from the combustion of a fresh supply of fuel becomes consumed, by passing over the 15 surface of a glowing fire in the fire-place contiguous. This is effected by dividing the furnace longitudinally into two or more parts, in order to form two or more distinct fire-places, which are to be supplied with fresh fuel alternately, allowing that in the adjoining fire-place over which the fresh smoke is to be directed to have become completely red. The direction of the smoke 20 and gases is regulated by dampers placed at the ends of the furnaces, in order that the communication with the flue may be cut off from such fire-place while the fresh fuel is introducing, and the smoke emitted is driven over the red hot fuel of the next fire-place through a lateral opening, by which means the smoke becomes consumed. In the accompanying Drawing, Fig. 1 represents 25 a transverse section, taken through about the middle of one of the improved furnaces; Fig. 2 is a longitudinal section, and Fig. 3 a horizontal section of the same. In all these Figures similar letters refer to corresponding parts. The furnace in these Figures is divided into two compartments A and B by the longitudinal partition *a*, placed in the middle between the fire-places. *b*, *c*, 30 are the dampers, which are to be slidden upon and down in grooves *d*, *d*, *d*, *d*, for the purpose of directing the smoke. Toothed racks *e*, *e*, are fastened to the lower ends of the sliding dampers, as seen in Fig. 1. A toothed wheel *f* takes into gear with the racks *e*, *e*, which is actuated by a pinion *g* fixed on the end of the shaft *h*. This pinion is made to revolve by turning the winch 35 handle *i* at its reverse end. In Fig. 1 the damper *c* is supposed to be up, and the damper *b* down; the fire B is represented as having just received a fresh supply of fuel, and the fire A burning brightly and giving off little or no smoke. As



FIG. 1.

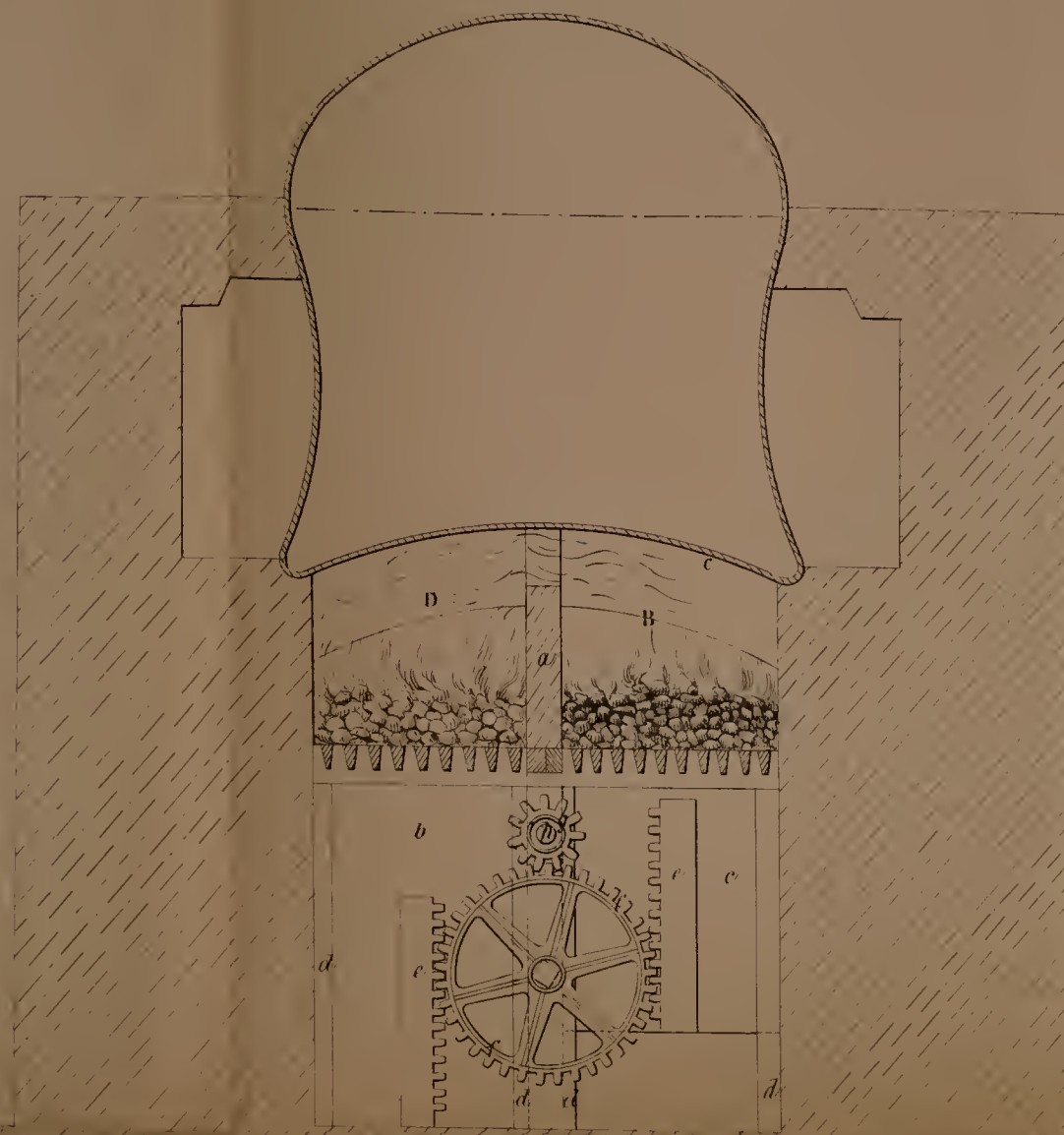


FIG. 2.

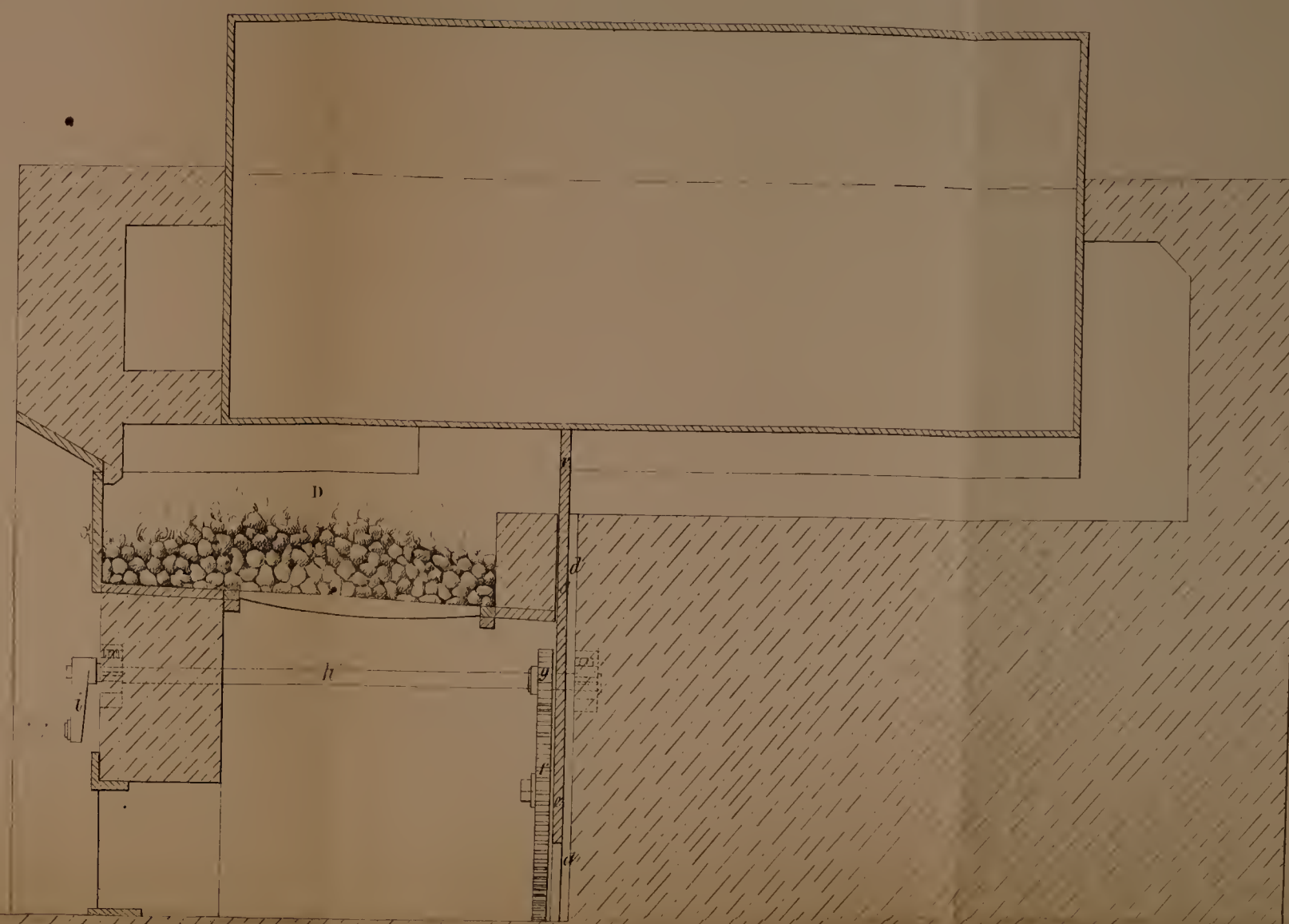
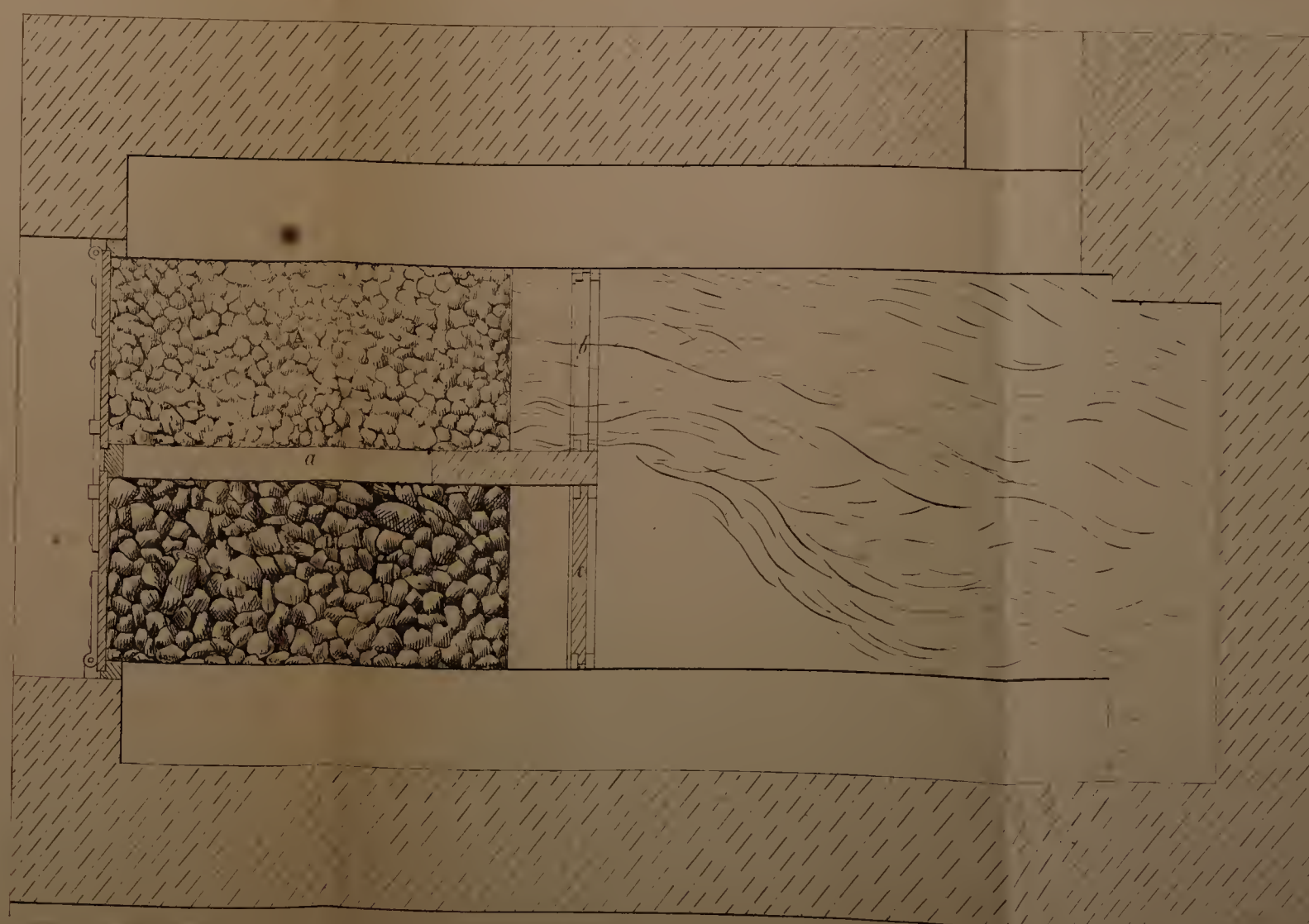


FIG. 3.



model drawing is colored





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*Hall's Improved Furnace for Consuming Smoke and Economizing Fuel, &c.*

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the damper *c* belonging to the fire-place B prevents the smoke from going forward directly into the flue, the smoke and vapour will of course be compelled to pass through the lateral opening in the partition *a*, and over the red hot fuel in the fire-place A, as seen in the Drawing, which smoke and vapour  
5 in its passage will necessarily become consumed or put into a state of combustion before it reaches the main flue surrounding the boiler. When the fuel in B has burnt up brightly, and ceased to give off smoke, then the damper belonging to it should be lowered, and the damper of the fire-place A raised, which are done simultaneously by means of the wheel and pinion before mentioned taking  
10 into the racks affixed to the dampers. The fire-place A may then be supplied with fresh fuel, the smoke and vapour from which will pass laterally through the aperture in the partition *a* over the red hot fire in B, and will be consumed as in the former instance. In conclusion, I desire it to be understood that I do not intend to confine myself precisely to the arrangement of the parts as  
15 shewn in the Drawing, being aware that they may be varied without deviating from the principle or main feature of my Invention; but I claim as my improvement in the arrangement of the parts of furnaces for steam boilers and other purposes the division of the furnace into two or more fire-places, by means of a longitudinal partition or partitions, having a lateral aperture or  
20 apertures communicating from one fire-place to the next fire-place adjoining, with movable dampers at the ends of the respective fire-places for occasionally stopping the flues, in order that the dense volume of smoke and combustible vapour evolved at every fresh supply of fuel may be conducted into the adjoining fire-place, where by passing over the ignited red hot fuel it may  
25 become burnt and consumed.

In witness whereof, I, the said Thomas Hall, have hereunto set my hand and seal, this Fifteenth day of August, in the year of our Lord One thousand eight hundred and thirty-nine.

THOMAS (L.S.) HALL.

30 Signed, sealed, and delivered by the  
within-named Thomas Hall in  
the presence of

W<sup>m</sup> MIDDLETON, Sol<sup>r</sup>, Leeds.

JOS<sup>n</sup> FINNIE, his Clerk.

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*Hall's Improved Furnace for Consuming Smoke and Economizing Fuel, &c.*

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MIDDLETON, Extra.

AND BE IT REMEMBERED, that on the Fifteenth day of August, in the Third year of the reign of Her Majesty Queen Victoria, the said Thomas Hall came before our said Lady the Queen in Her Chancery, and acknowledged the instrument aforesaid, and all and everything therein contained and specified, in form above written. And also the instrument aforesaid was stamped according to the tenor of the Statute made in the fifth year of reign of His late Majesty King George the Third. 5

Inrolled the Twenty-first day of August, One thousand eight hundred and thirty-nine.

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LONDON :

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Printers to the Queen's most Excellent Majesty. 1854.